UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,100	03/19/2002	Michel Jurgen	112740-242	8112

29177 7590 12/30/2003

BELL, BOYD & LLOYD, LLC
P. O. BOX 1135
CHICAGO, IL 60690-1135

EXAMINER	
MICHALSKI, JUSTIN I	

ART UNIT	PAPER NUMBER
2644	9

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,100	JURGEN ET AL.	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-28 and 30-36* is/are rejected.

7)☒ Claim(s) *29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 recites the limitation "the diaphragm" in line one of claim 28. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 19-21, 25-27, 30, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler et al. (US Patent 5,339,051) in view of Nedungadi et al. (US Patent 5,713,939).

Regarding Claim 19, Koehler et al. discloses a passive microphone for wirelessly transmitting sound information to a receiving unit (Figure 17, sensor 266) (Koehler disclose sensor can be used as a microphone) (Column 3, lines 26-27), comprising: an antenna (antenna 262) that receives an amount of electromagnetic excitation energy

from the receiving unit (unit 250); and a piezoelectric device (264 and 266) (Koehler discloses prior art that uses piezoelectric devices) (Column 1, lines 55-56) that is connected to the antenna (antenna 268) for receiving and storing the electromagnetic excitation energy from the antenna (power source 264) such that at least one acoustic signal is detected and converted into at least one electrical signal which includes sound information (output of antenna 268). Koehler et al. does not disclose the electrical signals are wirelessly transmitted back to the same receiving unit that transmitted the excitation energy or via the same antenna. Nedungadi et al. discloses a device (i.e. receiving unit) (Figure 4 reference 152) which sends external energy (i.e. electromagnetic excitation energy) (Column 1, lines 8-16) wirelessly to a remote device (reference 154) and also receives data from the remote device (Column 1, lines 8-16) via the same antenna (antenna 22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that excitation energy could have been transmitted and information received through the same antenna in order to avoid the positioning of conductive wires.

Regarding, Claim 21, Koehler et al. further discloses the piezoelectric device stores the electromagnetic excitation energy (figure 17, source 264) such that the piezoelectric device detects the at least one acoustic signal (sound signal from sensor 266) and converts it into the at least one electrical signal (through signal transmitting antenna 268).

Regarding Claim 25, Koehler et al. further discloses pressure (i.e. acoustic waves) being measured with a diaphragm (Column 3, lines 46-49) which would

inherently comprise a surface wave delay line due the physical properties of the sound waves traveling along the surface of the diaphragm.

Regarding Claim 26, Koehler et al. further discloses the piezoelectric device (Figure 17, references 264 and 266) comprises a first device for detecting the at least one acoustic signal (sensor 266) and a second device for storing the electromagnetic excitation energy (source 264) and converting the at least one acoustic signal (from sensor 266) into the at least one electrical signal (output of antenna 268).

Regarding Claim 27, Koehler et al. further discloses pressure (i.e. acoustic wave) measuring is done by using a diaphragm exposed to an environment to be measured (Column 3, lines 47-49).

Regarding Claim 30, Koehler et al. further discloses the second device (diaphragm (Column 3, lines 46-49) which would inherently comprise a surface wave delay line due the physical properties of the sound waves traveling along the surface of the diaphragm.

Regarding Claim 33, Koehler et al. further discloses the piezoelectric device receives the electromagnetic excitation energy from the receiving unit in a form of radio frequency power (i.e. short high-frequency signals) (Column 11, lines 3-8).

Regarding Claim 34, Koehler et al. further discloses the piezoelectric device receives the electromagnetic excitation energy from the receiving unit in a form of radio frequency power (i.e. periodically repeated high-frequency signals) (Column 11, lines 3-8).

Regarding Claim 35, Koehler et al. further discloses the piezoelectric device receives the electromagnetic excitation energy from the receiving unit in a form of radio frequency power (i.e. excitation signals that have a large bandwidth-time product) (Column 11, lines 3-8).

Regarding Claim 36, Koehler et al. further discloses the piezoelectric device receives the electromagnetic excitation energy from the receiving unit in a form of a radio frequency power (i.e. continuous frequency-modulated excitation signal) (Column 11, lines 3-8).

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler et al. as modified as applied to claim 19 above, and further in view of Takahata et al. (US Patent 4,641,054). Koehler et al. as modified discloses a microphone as stated above apropos of claim 19 but does not disclose the piezoelectric device temporarily stores the electromagnetic excitation energy in the form of mechanical vibrations. Takahata et al. discloses a piezoelect4ric electro-acoustic transducer that emits an audible sound (from mechanical oscillations) when an electric signal (electromagnetic excitation) is applied (Column 1, lines 18-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the piezoelectric device would temporarily store the electromagnetic excitation energy in the form of mechanical vibrations.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler at al. as modified as applied to claim 19 above, and further in view of Palfreeman et al. (US Patent 4,065,735). Koehler et al. as modified discloses a microphone as stated above apropos of claim 19. Koehler et al. as modified further discloses a diaphragm (Column 4, lines 21-23) but does not disclose the diaphragm having an acoustic wave resonant pattern. Palfreeman et al. discloses a piezoelectric surface having acoustic surface wave resonators arranged (i.e. pattern) on the surface (Column 9, lines 53-59). Palfreeman et al. discloses that resonators can be used as filters when formed with a plate of piezoelectric material (Column 1 lines 32-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use acoustic wave resonant patterns on the surface to take advantage of the filtering properties as taught by Palfreeman et al.

7. Claims 23, 24, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler et al. as modified as applied to claim 22 above, and further in view of Ichikawa et al. (US Patent 5,757,250).

Regarding Claim 23, Koehler et al. as modified discloses a microphone as stated above apropos of claim 22 but does not disclose the diaphragm composed of a crystal. Ichikawa et al. discloses that it is preferable that an acoustic wave module substrate (i.e. diaphragm) is made of quartz (i.e. crystal) (Column 5, lines 61-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diaphragm composed of a crystal as taught by Ichikawa et al.

Regarding Claim 24, Koehler et al. as modified discloses a microphone as stated above apropos of claim 22 but does not disclose the diaphragm composed of a crystal. Ichikawa et al. discloses that it is preferable that an acoustic wave module substrate (i.e. diaphragm) is made of $LiNbO_3$ (i.e. lithiumniobate) (Column 5, lines 61-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diaphragm composed of lithiumniobate as taught by Ichikawa et al.

Regarding Claim 28, Koehler et al. as modified discloses a microphone as stated above apropos of claim 26 but does not disclose the diaphragm composed of a metal. Ichikawa et al. discloses that it is preferable that an acoustic wave module substrate (i.e. diaphragm) is made of $LiNbO_3$ (i.e metal) (Column 5, lines 61-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a diaphragm composed of lithiumniobate as taught by Ichikawa et al.

8. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler et al. as modified as applied to claim 19 above, and further in view of Murase (US Patent 5,751,418).

Regarding Claim 31, Koehler et al. as modified discloses a microphone as stated above apropos of claim 19 but does not disclose an additional piezoelectric device. Murase discloses an electroacoustic transducer (Figure 1) which comprises of two piezoelectric devices (elements 52 and 50) which are differentially converted into an electrical signal (74). Murase discloses that the use of a differential amplifier removes

induced noises from the electric signals (Column 1, lines 58-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two elements and a differential signal of the two in order to reduce noise in the electric signal to produce a cleaner output.

Regarding Claim 32, Koehler et al. as modified discloses a microphone as stated above apropos of claim 19 but does not disclose compensation for disturbance variables. Murase discloses an electroacoustic transducer (Figure 1) which differentially converts the differentially converts the output of piezoelectric sensors (52 and 50) into an electrical signal (74). Murase discloses that the use of a differential amplifier removes induced noises (i.e. disturbance variables) from the electric signals (Column 1, lines 58-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two elements and a differential signal of the two in order to reduce noise in the electric signal to produce a cleaner output.

Allowable Subject Matter

9. Claim 29 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

JIM

XU MEI
PRIMARY EXAMINER